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COMPETITIVE MARKET

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Abstract

The behavioral decision theory literature was used to identify the determinants of negotiation success in an integrative bargaining, free market exercise. This study provides a novel methodology for studying negotiation. Specifically, buyers and sellers were allowed to engage in negotiation with as many competitors as possible in a fixed time period. The results suggest that integrative bargaining behavior increases and the market converges towards a Nash equilibrium as negotiators gain experience. In addition, the results suggest that (1) positively framed negotiators ("what will be my net profit from the transaction?") complete more transactions than negatively framed negotiators ("what will be my expenses on this transaction?"), (2) negotiators who are given moderately difficult profit constraints in order to be allowed to complete a transaction achieve more profitable transactions that negotiators without such constraints, and (3) both framing and the existence of constraints affect the total profitability of the negotiator.

The investigation of negotiation has occupied a central position in labor relations (Walton and McKersie, 1965; Kochan, 1980) and social psychology (Rubin and Brown, 1975; Rubin, 1980; Pruitt, 1981). More recently, the study of negotiation has emerged as a concern of organizational scholars as they try to understand such phenomena as budgeting, transfer pricing, and market transactions (Bazerman and Lewicki, 1983). One of the primary topics of negotiation research concerns the processes that lead to the development of integrative agreements. An agreement is said to be integrative when the negotiators locate and adopt options that incorporate the needs of both parties and produce solutions of high joint benefit. This study is based on the behavioral decision theory literature and identifies the determinants of integrative behavior in a free market simulation.

Integrative agreements are solutions to conflict that reconcile the parties' interests and yield joint benefits higher than those created by a simple compromise. This is illustrated by the story of the two sisters who fought over an orange (Follett, 1940). The two sisters agreed to split the orange in half -- a compromise -- allowing one sister to use her portion for juice and the other sister to use the peel of her half for a cake. The two parties in this conflict overlooked the <u>integrative</u> agreement of giving one sister all the juice and the other sister all the peel.

Walton and McKersie (1965) proposed two contrasting models of the bargaining process. The distributive model views negotiation as a procedure for dividing a fixed-pie of resources --"How much of the orange does each sister receive?" According to this model, what one side gains, the other side loses. In contrast, Walton and McKersie's integrative bargaining model views negotiation as a means by which parties can make trade-offs or jointly solve problems to the mutual benefit of both parties -- "How can the orange be divided to maximize the joint benefit of the two sisters?" According to this model, the success of the two sisters at joint problem solving will determine the size of the pie of resources to be distributed.

Pruitt (cf. 1983) has conducted extensive experimental work on the determinants of integrative bargaining behavior. In his studies, subjects engaged in a single negotiation with a single opponent. He found that negotiators who had an incentive to compromise and high aspiration levels were far more likely to behave integratively than were negotiators without an incentive to compromise and low aspiration levels. In addition, he found that when negotiators had a positive relationship with the other party and were highly accountable to a constituency, integrative behavior was more likely to occur (Ben Yoav and Pruitt, in press).

In contrast to Pruitt's work on a single transaction, single opponent task, the research presented here examines negotiator

behavior in a free market context in which negotiators can make transactions with multiple opponents in a fixed amount of time. Thus, the same high aspiration level that creates a higher likelihood of an integrative agreement in Pruitt's single transaction (without a specified time limit) may prove to be a costly time drain in the simulated market. In addition, Pruitt's research suggests that negotiators deviate significantly from achieving the fully integrative (and pareto optimal) agreements that exist. The current research explores whether this is a permanent effect or whether this effect is limited to Pruitt's one trial, one opponent methodology. Plott and Agha (1983) propose the alternative hypothesis that markets converge to an equilibrium, implying that negotiators will learn to become integrative over time.

This research explores the determinants of integrative behavior and success for the negotiator. While integrative behavior and success are conceptually related, success is determined by both the quality of transactions (which are affected by the integrative nature of the agreement) and the quantity of transactions. The specific variables that are examined as determinants of integrative behavior and success in a free market are (1) the frame (positive versus negative) of the negotiators and (2) the existence of limit setting (constraints) on negotiators. Each of these is explored in the sections that follow.

The Frame of Negotiation

Consider the following two scenarios:

    The average employee is currently earning $10/hour. The

    inflation rate is 10%. The union is demanding a $1/hour

    increase to keep up with inflation. Your side, management,

    maintains that no increase is possible in the current

    economic environment. Would a $.40/hour increase represent a

    nominal loss to management of $.40/hour or a real dollar gain

    of $.60/hour?

    You are a wholesaler of refrigerators. Corporate policy does

    not allow any flexibility in pricing. However, flexibility

    does exist in terms of expenses that you can incur (shipping,

    financing terms, etc.), which have a direct effect on the

    profitability of the transaction. These expenses can all be

    costed out in dollar value terms. When you negotiate the

    terms of a transaction, are you trying to minimize the losses

    resulting from the expenses incurred or maximize the overall

    net gain of that sale?

In each situation, the answer to the question posed is "both."

Each question is similar to the famous question, "is the cup half

full or half empty?" From a normative perspective, and based on

our intuition, the difference in the two points of view is

irrelevant. Recently, however, Kahneman and Tversky (1979, 1982;

Tversky and Kahneman, 1981) have suggested that important

differences exist between how individuals respond to questions

framed as losses versus those framed as gains. This section explores the impact of this framing effect on negotiators in a free market.

Tversky and Kahneman (1981) presented the following problem to a group of subjects:

> The U.S. is preparing for the outbreak of an unusual Asian disease which is expected to kill 600 people. Two alternative programs are being considered. Which would you favor?
>
>> 1. If Program A is adopted, 200 will be saved.
>> 2. If Program B is adopted, there is a one-third probability that all will be saved and a two-thirds probability that none will be saved.

Of 158 respondents, 76% chose Program A, while only 24% chose program B. The prospect of being able to save 200 lives for certain was more valued by most of the subjects than a risky prospect of equal expected value. Thus, most subjects were risk averse.

A second group of subjects received the same cover story and the following two choices:

>> 1. If Program A is adopted, 400 people will die.
>> 2. If Program B is adopted, there is a one-third probability that no one will die and a two-thirds probability that 600 people will die.

Out of the 169 respondents in the second group, only 13% chose Program A, while 87% chose Program B. The prospect of 400 people dying was less acceptable to most of the subjects than a two-thirds probability that 600 will die. Thus, most subjects were risk seeking to the second set of choices.

Careful examination of two problems finds them to be objectively identical. However, changing the description of outcomes from lives saved (gains) to lives lost (losses) was sufficient to shift the majority of subjects from a risk averse to a risk seeking orientation.

The normative analysis of utility theory would predict the same response when objectively identical problems are presented. These well-replicated findings (in the example above), however, are consistent with Kahneman and Tversky's (1979) Prospect Theory, which states that potential gains and losses are evaluated relative to their effect on current wealth. Choice is explained by an S-shaped value function which is convex (indicating a risk averse orientation) for gains and concave (indicating a risk seeking orientation) for losses (see Figure 1).

Insert Figure 1 about here

To exemplify the importance of "framing" to negotiation, consider the following labor-management situation suggested by Bazerman and

Neale (1983): The union claims they need a raise to $12/hour, and that anything less would represent a loss given the current inflationary environment. Management argues that they cannot pay more than $10/hour, and that anything more would impose an unacceptable loss. What if each side had the choice of settling for $11/hour (a certain settlement) or going to binding arbitration (a risky settlement)? Since each side is viewing the conflict in terms of what they have to lose, following Tversky and Kahneman's (1981) findings, each side is predicted to be risk seeking to losses and unwilling to take the certain settlement. Changing the frame of the situation, however, results in a very different predicted outcome: If the union views anything above $10/hour as a gain and management views anything under $12/hour as a gain, then positive frames will exist, risk aversion will dominate, and a negotiated settlement is predicted. Empirically, Neale and Bazerman (1983) have found that positively framed negotiators are significantly more concessionary and successful than negatively framed negotiators.

This study explores the impact of the frame of buyers and sellers in an open market simulation. The open market simulation allowed buyers and sellers to complete transactions on a three issue integrative bargaining problem with as many opponents as possible in a fixed amount of time -- with total profit the goal. Negotiators were led to view a transaction in terms of either (1) net profit (gains) or (2) expenses (losses) away from the gross

profit of the transaction. While net profit is equal to gross profit less expenses, the logic above suggests that positively (gain) framed negotiators will be more risk averse and have a stronger desire to achieve resolutions than negatively (loss) framed negotiators. In our market context, this leads to the prediction that positively framed negotiators will complete more transactions than negatively framed negotiators.

Limit Setting (Constraints) in Negotiation

Pruitt (cf. 1983) has demonstrated repeatedly that paired negotiators who both have moderately difficult goals negotiate more integratively than paired negotiators with no externally set goals. Simple compromises cannot produce the stated goals in Pruitt's simulation. Essentially, his results demonstrate that when both negotiators have limitations on the transaction that they can accept due to organizationally set profit constraints, an environment is produced which necessitates the search for integrative solutions. Without any time limitations, the result is clear -- greater integrative behavior results.

Pruitt's results are consistent with goal setting research in the motivation literature (cf. Latham and Locke, 1979). The goal setting literature shows that employees exposed to moderately difficult goals outperform employees with either no externally set goals or very difficult goals. Pruitt's goal setting condition implies the existence of moderately difficult goals.

In contrast, a basic axiom of economics states that additional choices can only make a decision-maker better-off and that additional constraints can only make a decision-maker worse-off (Thaler, 1980). This position would argue that the existence of a constraint on the offers that a negotiator is allowed to accept can only hinder his/her effectiveness. That is, the economically rational negotiator without a constraint should achieve the same high quality agreements that the negotiator with a constraint achieves when such high quality agreements are possible. In addition, the absence of constraints should produce greater flexibility to the negotiator, allowing additional opportunities for profit.

In summary, Pruitt argues and provides data that imposing limitations (constraints) which limit the negotiator to only accepting agreements above a moderately challenging profit standard positively affects integrative behavior and the negotiator's success. The economic position argues that these constraints will have a negative effect on negotiator effectiveness -- implying that Pruitt's results are limited to the one transaction, one opponent methodology described earlier. This study will treat these as opposing hypotheses to be tested in a market simulation.

Based on the argument developed above, the following hypotheses are proposed:

Hypothesis 1. As negotiators gain experience in a market, their behavior will become more integrative and converge to the economically proposed equilibrium.

Hypothesis 2. In a market context, positively framed negotiators will complete more transactions than negatively framed negotiators.

Hypothesis 3. In a market context, the increase in the number of transactions completed (as specified in Hypothesis 2) will lead positively framed negotiators to be more profitable than negatively framed negotiators.

Hypothesis 4. Negotiators with moderately difficult externally set profit constraints will achieve more profitable individual agreements than negotiators without externally set constraints.

Hypothesis 5a. The increase in the quality of agreements (as specified in Hypothesis 4) will result in negotiators with moderately difficult externally set constraints achieving greater overall profitability than negotiators without externally set constraints. (Pruitt's prediction)

Hypothesis 5b (competing hypothesis). Negotiators with
moderately difficult externally set constraints will achieve
less overall profitability than negotiators without externally
set constraints (the economist's position).

Methods

Subjects

One hundred and seventy-eight graduate and undergraduate students
participated in one of six runs of a free market simulation. Each
run was part of a class. A description of the six classes is
provided in Table 1.

Insert Table 1 about here

Design

As the subjects entered the classroom, they were randomly assigned
to one of eight conditions. Subjects were assigned to be (1)
either a buyer or seller, (2) either positively or negatively
framed, and (3) either in a constraint or no constraint condition
-- resulting in a 2 X 2 X 2 design. All six runs of the
simulation had exactly equal numbers of buyers and sellers.
However, slight variation in cell sizes across the other two
factors was necessary due to the number of subjects in the run.

Procedure

Upon arrival in the classroom, instructions were provided to all subjects that described the exercise as a simulation of a free market between buyers (retail stores) and sellers (manufacturers of refrigerators). Participants were told that product quality among all manufacturers was undifferentiable and that profits (or expenses) were affected by only three factors: delivery terms, discount level, and financial terms. The information packet included a profit schedule showing nine levels labeled "A" through "I" for each of the factors (see Tables 2a and 2b for seller and buyer profit schedules). Subjects saw only the profit schedule for their role.

Insert Tables 2a, 2b, 2c and 2d about here

Buyers achieve their highest profits and sellers their lowest profits at the "A" levels of delivery, discount, and financing, whereas sellers achieve their highest profits and buyers their lowest profits at the "I" levels. In addition, delivery time holds the highest profit potential and financing terms holds the lowest profit potential for buyers. In contrast, delivery time holds the lowest profit potential and financing terms holds the highest profit potential for sellers. The exercise thus offers integrative potential. Although an extremely unlikely possibility, if either party were able to convince the other party

to accept his/her optimal terms (A-A-A for buyers, I-I-I for sellers), then his/her profit for the transaction would be equal to $8,000. The opponent would receive $0. The simple compromise solution of E-E-E yields $4,000 to each party, and a combined profit to the two negotiators of $8,000. However, if the parties are able to reach the fully integrative agreement of A-E-I, then each would receive a profit of $5,200 and the combined profit of the two negotiators would be $10,400.

The market methodology used in this study responds to the limitations of field research on negotiation (e.g., inaccessibility of private negotiations, the difficulties of obtaining causal data, the difficulty in obtaining data on the same independent and dependent variables across transactions). At the same time, the market methodology overcomes many of the limitations accepted by most social psychological laboratory studies of negotiation (e.g., one-shot negotiations, the assumed irrelevancy of time, external validity, ignoring the existence of economic markets that surround the transaction). Specifically, the experiment uses a rich-context simulation (Greenhalgh and Neslin, 1983) that purists of both the laboratory and field research traditions may find to be less than fully satisfactory. However, the market experiments may provide the best joint optimization of (1) the control necessary to understand the decision processes of negotiators and (2) the reduction of the inherent limitations of laboratory studies.

Each subject was told that he/she was either a buyer or seller in a market in which they could complete as many transactions as possible in a fixed (30 minutes) amount of time. For example, a buyer could potentially complete as many transactions as the number of sellers in the room. Since an equal number of buyers and sellers existed in each market and the simulation was perfectly symmetrical, all negotiators in a particular market had identical profit potential. A buyer (seller) could complete only one transaction with any one seller (buyer). The logistics of the market required buyers and sellers to make contact at the front of the classroom and then proceed to a "bargaining area" to engage in the actual negotiation. Once an agreement was reached, a "transaction form" was completed, which identified the buyer and seller and the delivery, discount and financing terms agreed upon. In addition, the time of the transaction (0 to 30 minutes) was recorded by the experimenters for each transaction. After jointly turning in the form, the buyer and seller were free to return to the front of the classroom in order to make contact for another transaction. This cyclical procedure continued until the end of the thirty minute market session.

The framing manipulation. As previously mentioned, both buyers and sellers were randomly assigned to either a positively framed condition or a negatively framed condition. Positively framed subjects were given the role specific profit tables (2a and 2b)

previously discussed. For the negatively framed condition, these tables were converted into "expenses" that the subject would incur -- that would be taken away from the $8,000 gross profit that would be received for each completed transaction. This transformation can be seen for buyers and sellers in Tables 2c and 2d. Since net profit is defined to be equal to gross profit minus expenses, Tables 2a and 2b are identical objectively to Tables 2c and 2d. For example, the seller's profit for A-E-I is $5,200, the sum of 0 + $1,200 + $4,000 (Table 2b). In Table 2d, this same transaction would result in expenses of $2,800, the sum of $1,600 + $1,200 + 0. When $2,800 is subtracted from the $8,000 gross profit, the same $5,200 net profit is received. Thus both forms of the schedules yield the same profit results, with the only difference being that the positively framed negotiators see the terms as net profits, whereas the negatively framed negotiators see the same terms as expenses. In addition, all further instructions were given in terms of profits for positively framed negotiators and in terms of expenses for negatively framed negotiators. However, all subjects were given the general instruction to maximize their total profit during the 30 minute market.

Limit setting (constraints). Limit setting was manipulated by including a "confidential memo" in the information packet of subjects in the "constrained" condition. The memo was not included in the packets of those in the "unconstrained"

condition[2]. The memo was signed by the negotiator's supervisor. This memo stated that it was against company policy to accept any transaction that did not meet minimum requirements. For example, subjects in the positive frame/constrained condition read:

> "...do not under any circumstances make any deals which result in total profit of less than $4,600. At this limit, the transaction is detrimental to the overall financial welfare of the company. If you cannot reach this goal with a particular seller, you should break off negotiations since there are other firms we can deal with..."

In the negative frame/constrained level condition, subjects read the following:

> "...do not under any circumstances make any deals which result in expenses of more than $3,400. At this limit..."

After administering a short quiz to ensure that the profit and expense schedules were understood, subjects were given final instructions prior to negotiations. For example, positively framed sellers were told:

> "talk to buyers and make deals which specify all three factors. That is you should propose three-letter deals in your negotiations...overall net profit will be determined by summing the net profits of all the transactions that you complete...assume that market conditions are such that your firm can produce all the refrigerators that you can sell."

After these final instructions, the market began. Upon completion of the market, all participants completed a post-simulation

questionaire that further verified their understanding of the
exercise and assessed a number of common attitudes about
negotiation. Finally, subjects were given detailed personal and
general feedback in the following class session.

Results

Preliminary analyses. Two items were included in the post-
simulation questionaire as manipulation checks on the constraint
and frame manipulations. The constraint manipulation was assessed
by asking all subjects the open ended question: "Was there an
explicitly stated rule concerning minimum requirements for you to
be allowed to accept a transaction? If yes, explain." 82 of the
89 subjects in the constrained condition responded "yes" and
identified the existence of the minimum profitability rule that
was included in their packet. None of the 89 subjects in the
unconstrained condition mentioned any minimum requirements. Thus,
it is assumed that the manipulation was effective.

To assess the framing manipulation, all subjects were asked to
respond to the following question on a seven point scale: "When
negotiating a transaction, how did you think about your goal? (1 =
"minimize expenses", 7 = "maximize net profits"). Positively
framed negotiators responded significantly higher than negatively
framed negotiators (5.88 vs. 3.40, $p < .01$), confirming the
framing manipulation.

Finally, to verify that subjects understood the differential payoffs across issues (that created the integrative problem), all subjects were asked which of the three factors was most important to them and which one was least important to them. When responding to these question, subjects no longer had their payoff tables in front of them. Overall, 86% of the responses to these questions were consistent with the payoff tables provided to the subjects.

Hypothesis 1. It was predicted that negotiators would become more integrative over time. We examined this pattern for each of the six markets separately, as well as in the aggregate. Figure 2 shows the average profit for buyers and sellers for each five minute time interval (0-5 minutes, 5-10 minutes,..,25-30 minutes). The diagonal line running from the top left to the bottom right represents the non-integrative agreements available to negotiators. Notice that all points on this line result in a joint profit of $8,000. The outermost boundary represents the pareto frontier available to negotiators, with the point $5,200, $5,200 representing the Nash equilibrium solution that is the economic prediction of the solution that two negotiators will achieve. The Nash equilibrium is defined to be equal to the point that maximizes the product of the utilities of the two parties (Nash, 1950).

Insert Figures 2, 2a, 2b, 2c, 2d, 2e, and 2f about here

Figure 2 plots the averages of buyer and seller profit of all
agreements reached in each 5 minute segment of the market
(aggregated across all six markets). This figure shows that
negotiators tend to start the exercise by achieving distributive
agreements -- the result of compromises rather than the
integration of their interests. As the market continues,
negotiators become increasingly integrative. By the end of the
market, many transactions are fulfilling the Nash prediction.
Figures 2a, 2b, 2c, 2d, 2e, and 2f show the consistency of this
pattern across markets. The impact of time on joint profit can be
shown formally for the six markets combined by the regression
(N = 942):

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(1)   JPROFIT = $8,551 + $55.4 T + ε ,

$$(p < .001)$$

$R^2 = .25$ F = 312.1

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where, JPROFIT is equal to the joint profit of the two negotiators
and T is equal to the minute (from 0 to 30) of the market in which
the transaction was completed. The results suggest clearly that
integrative behavior increases as the market develops and that the
market converges towards the Nash equilibrium.

An important question to answer about the increased integration over time concerns "Who gets the added profit?" Figure 3 plots the profit of the more profitable negotiator in a transaction, the less profitable negotiator in a transaction, and their joint profit in 5 minute intervals of the market. The general pattern shows that the joint profit increases primarily due to the increased profit of the less profitable negotiator. The profit of the more profitable negotiator remains relatively constant across the market. This suggests (1) that one negotiator can often help the other negotiator without incurring costs and (2) that integrative bargaining increases the equity between two negotiators. Finally, Figures 3a, 3b, 3c, 3d, 3e, and 3f show the consistency of this pattern across markets.

Insert Figures 3, 3a, 3b, 3c, 3d, 3e, and 3f about here

Hypotheses 2 through 5. These hypotheses dealt with the impact of constraints and frame on the success of negotiators. Specifically, the hypotheses made predictions about (1) the number of transactions that a negotiator completed, (2) the profitability of the transactions that a negotiator completed, and (3) the total profitability of negotiators. Table 3 provides the means of the three dependent variables for each cell in the design, collapsing across the buyer/seller factor. The means are provided for each of the six markets, as well as the average across the six

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Insert Table 3 about here

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markets.   In addition, the number of subjects in each cell of each market is specified in Table 3.   The pattern of results suggests that (1) positively framed negotiators complete more transactions than negatively framed negotiators, (2) constrained negotiators complete more profitable transactions than unconstrained negotiators, (3) both independent variables affect the total profitability of the negotiator, and (4) there exists wide variation in the average profitability of negotiators across markets.

Before creating regressions which will test the predicted relationships for statistical significance, it is appropriate to identify other factors in the experiment that are likely to affect the three dependent variables. First, Table 3 suggested that significant differences exist in these variables between the six markets that were run. That is, holding constant the impact of the hypothesized independent variables, the negotiator's market significantly affected his/her performance. Consequently, in the interest of obtaining the best assessment of the impact of the hypothesized independent variables, dummy variables were included to control for the variation in the dependent variables due to market differences. Second, the exercise was set up symmetrically, leading to the expectation that, on average, buyers

and sellers would do equally well. Surprisingly, this was not the
case. Thus, a dummy variable is entered for whether the
negotiator was a buyer or seller. These additions resulted in the
following three regressions $(N = 178)$[3]:

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(2) TRANS = 3.83 + .85 FRAME + .05 LIMIT + .00 BUYSEL + 3.47 D2
                    (p<.001)   (ns)   (ns)   (p<.001)

        + 3.18 D3 + 5.64 D4 + 7.86 D5 + 9.95 D6 + ε

        (p<.001) (p<.001) (p<.001) (p<.001)

R^2 = .70   F = 49.8

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(3) AVPRF = 2011 - 2.6 FRAME + 394 LIMIT + 296 BUYSEL - 213 D2
                        (ns)   (p<.001)   (p<.001)   (p<.001)

        + 273 D3 + 170 D4 - 95 D5 + 139 D6 + ε

        (p<.001) (p<.05)   (ns)   (ns)

R^2 = .37   F = 12.2

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(4) TOTAL = 10004 + 3934 FRAME + 4856 LIMIT + 3327 BUYSEL
                        (p<.001)   (p<.001)   (p<.001)

        + 14160 D2 + 16867 D3 + 28173 D4 + 35345 D5 + 48600 D6 + ε

        (p<.001)   (p<.001)   (p<.001)   (p<.001)   (p<.001)

R^2 = .73   F = 57.6

In these regressions, TRANS was equal to the number of
transactions a negotiator completed, AVPRF was equal to the

negotiator's average profit per transaction, and TOTAL was equal
to the negotiator's total profit. All independent variables were
dummy variables, where: FRAME was equal to 0 for negatively framed
negotiators and 1 for positively framed negotiators; LIMIT was
equal to 0 for the unconstrained condition and 1 for the
constraint condition; BUYSEL was equal to 0 for sellers and 1 for
buyers; and Oi was equal to 1 if the negotiator was in the ith
market and 0 otherwise.

Overall, the betas from these regressions demonstrate the earlier
observed effects described by the mean differences in Table 1.
Specifically, positively framed negotiators, on the average,
completed .85 more transactions than negatively framed negotiators
(Equation 2, p<.001)[4]. This effect confirms Hypothesis 2. The
average profit from transactions completed by constrained
negotiators was, on average, worth $394 more than the average
profit from transactions completed by unconstrained negotiators
(Equation 3, p<.001). This effect confirms Hypothesis 4. The
total profit of positively framed negotiators was, on the average,
$3934 higher than the total profit of negatively framed
negotiators (Equation 4, p<.001). This effect confirms Hypothesis
3. And finally, the total profit of constrained negotiators was,
on average, $4856 higher than the total profit of unconstrained
negotiators (Equation 4, p<.001). This effect confirms Hypothesis
5a, and rejects Hypothesis 5b.

These regressions also show that buyers are significantly more successful than sellers (Equations 3 & 4). In addition, Equations 3, 4, & 5 show dramatic differences in the quantity and quality of transactions across markets.

Discussion

The results demonstrate that experience has a very powerful influence on the degree to which negotiators exhibit integrative behavior. Early in the markets, negotiators generally arrived at distributive agreements. This suggests that negotiators start the simulation with a fixed-pie assumption, consistent with Bazerman and Neale's (1983; Bazerman, 1983) argument that negotiators have a fundamental bias that leads them to enter bargaining situations with a win-lose, fixed-pie perspective. As the market develops, however, negotiators acquire the information to break this fundamental bias, which allows them to engage in integrative behavior. This research raises questions about the validity of one-shot studies of negotiator behavior. The current research suggests that such one-shot investigations ignore the dynamic nature of most competitive interactions. Further, the differential effects of integrative behavior over time suggest that negotiation researchers should understand the learning process as they explain the degree to which negotiators develop integrative agreements.

The analyses demonstrate that limit setting, or constraints, on

negotiators can be very effective in improving their performance.
Specifically, negotiators with moderately difficult goals achieved
more profitable agreements than negotiators without specified
goals. This result is consistent with Pruitt's (1983; Ben Yoav
and Pruitt, 1982) research. Further, this constraint had no
effect on the number of transactions that a negotiator completed.
This latter result refutes the economist's prediction that
imposing a constraint on a decision maker can only hinder his/her
overall performance. This result, which is paradoxical given the
rationality of the economist's prediction, can be explained in
terms of the learning process created by the constraint.
Constrained negotiators need to learn quickly how to develop
integrative solutions, since simple compromises will not allow
them to achieve their goals. Once they arrived at integrative
agreements early in the market, their new integrative behaviors
were useful in arriving at future agreements in a very efficient
manner. Once a subject learned of the A-E-I solution, arriving at
mutually acceptable agreements was a very easy task.

The results found that positively framed negotiators completed
significantly more transactions than negatively framed
negotiators. This result is consistent with Kahneman and
Tversky's Prospect Theory, and contradicts the form of rationality
suggested by utility theory. That is, negotiators with the same
objective information may compromise to very different degrees
depending on the frame (gains versus losses) in which they view

the transaction. Future research should address (1) how an understanding of framing affects negotiator performance, (2) how negotiators can frame the behaviors of their opponent, and (3) how mediators can frame the behaviors of negotiators to be more effective at dispute resolution.

A few unexpected results also occured. First, despite the existence of a completely symmetrical simulation, buyers outperformed sellers. This effect was consistent across markets. We do not have a clear explanation of this result. However, it may reflect the perceived bargaining power that many buyers feel -- "If you don't lower the price, I will buy elsewhere." Obviously, in the simulation, the reverse argument should have been, but was not, just as persuasive. The second result that was not part of the theoretical development concerns the extreme differences in negotiator performance between markets. While some differences were expected, the six markets performed at fundamentally different levels. Part of this may have been due to differences in the intelligence, maturity, etc. of the participants in the various markets. In addition, as the number of participants in a market increases, the nature of the competitive situation increases the potential of all subjects, since there are more potential opponents. Unfortunately, identifying the accurate causation of the market effect is not possible with only six observations.

This study identifies some important determinants of integrative behavior in a market simulation. To place the importance of these results in perspective, it is useful to identify the benefits of integrative agreements:

    (1) Integrative agreements maximize the joint benefit of the two parties.

    (2) If high aspirations exist on both sides, it may not be possible to resolve a conflict unless a way can be found to integrate the two parties' interests (Pruitt, 1983).

    (3) Because integrative agreements are mutually rewarding, they tend to strengthen the relationship between the parties. This facilitates future interaction between the parties (Pruitt, 1983).

    (4) Integrative agreements often contribute to the welfare of a broader community of which the two parties are members (Pruitt, 1983). For example, if firms in the U.S. behave more integratively, increasing their profitability, they can be more competitive with foreign competitors.

Thus while the study only demonstrates the impact of constraints and framing on increasing the joint profit of the two parties, the increase in integrative agreements that these variables create is likely to have more extensive benefits.

This paper introduces the market simulation as a novel methodology for understanding integrative behavior. The methodology was conceived as an integration of classical laboratory

experimentation, experimental economics, and traditional field experiments. The advantage of using this simulation lies in its capturing much of the dynamic nature of negotiation, while retaining control over the independent variables which is needed to achieve internal validity. This methodology is appropriate for a variety of other theoretical questions concerning negotiation. This research is consistent with the belief that more creative research can be achieved when researchers in the field and laboratory move beyond the traditional data collection procedures.

Finally, this paper introduces the study of decision biases as a new approach for understanding negotiator behavior. However, the fixed-pie assumptions and the impact of framing are a small sampling of the systematic deviations from rationality that affect negotiator judgment (Bazerman and Neale, 1983). Future empirical research should further identify how the behavioral decision theory literature can be used to understand and improve negotiator behavior. While the description of systematic biases that affect negotiators is a critical step in the development of the negotiation literature, research needs to advance to the point of providing prescriptive recommendations for eliminating these judgmental deficiencies. With these advances, the study of negotiator cognition has the potential both to improve negotiator outcomes and to enhance the probability of negotiators reaching settlements that are in society's interest.

In conclusion, this paper has identified a new conceptual direction for improving negotiation effectiveness and has specified a new methodology for studying negotiation that integrates the benefits of traditional methodologies. This research on negotiator cognition complements the existing negotiation literature that (1) provides normative prescriptions (e.g., Raiffa, 1982), (2) identifies structural interventions (Pruitt, 1981), and (3) specifies the role of personality characteristics (Rubin and Brown, 1975).

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2. While subjects in the unconstrained condition may determine their own constraints, the theoretical development of this paper is concerned with the impact of _externally_ set constraints.

3. An alternative to inserting dummies for the market differences would be to incorporate variables that represent the characteristics of the markets. Two potentially important variables are the size of the market (see Table 1) and whether the class was an undergraduate or MBA class. Substituting these factors for the market dummies results in the following alternative regressions: (This alternative analysis was post-hoc and suggested by Leigh McAlister)

----

(2)' TRANS = -5.60 + .85 FRAME + .02 LIMIT + .00 BUYSEL

$\qquad\qquad\qquad\quad$ (p<.001) $\qquad$ (ns) $\qquad\qquad$ (ns)

$\qquad$ + 4.27 MBA + .42 NMARKET + ϵ

$\qquad$ (p<.001) $\qquad$ (p<.001)

R^2 = .68 $\qquad\qquad$ F = 76.0

----

(3)' AVPRF = 4056 - 6.2 FRAME + 402 LIMIT + 296 BUYSEL

$\qquad\qquad\qquad\qquad$ (ns) $\qquad$ (p<.001) $\qquad$ (p<.001)

$\qquad$ + 61 MBA - 1.3 NMARKET + ϵ

$\qquad$ (ns) $\qquad\qquad$ (ns)

R^2 = .26 $\qquad\qquad$ F = 11.8

----

(4)' TOTAL = -34924 + 3841 FRAME + 4787 LIMIT + 3328 BUYSEL

$\qquad\qquad\qquad\qquad$ (p<.001) $\qquad$ (p<.001) $\qquad$ (p<.001)

$\qquad$ + 20877 MBA + 1974 NMARKET + ϵ

$\qquad$ (p<.001) $\qquad$ (p<.001)

R^2 = .71 $\qquad\qquad$ F = 85.7

In these alternative regressions, MBA was equal to 1 for MBA classes and 0 for undergraduate classes and NMARKET was equal to the number of individuals in the market.

These regressions show that the experience (MBA) and size of the market affected significantly the number of transactions completed and the total profitability of negotiators. This change in the model, however, has virtually no impact on any of the other

effects that were examined in the text of the paper.

4. An alternative interpretation of the framing manipulation
(offered independently by David Schkade and Dean Pruitt) is that
the negative frame simply requires more time from the negotiator
to evaluate the quality of an offer. This could slow down
negatively framed negotiators; reducing the number of transactions
that they could complete. While this is a viable alternative
interpretation, the explanation in the text is consistent with the
framing effect observed by Neale and Bazerman (1983) on
negotiators in a labor-management simulation. In the Neale and
Bazerman (1983) study, the negatively framed task was no harder to
evaluate than the positively framed task.

TABLE 1

DESCRIPTION OF NEGOTIATORS IN EACH MARKET

MARKET	UNIVERSITY	COURSE	PROGRAM	# OF STUDENTS
1	University of Arizona	Organizational Behavior elective	Undergraduate	22
2	Boston University	Required Marketing course	Undergraduate	32
3	Boston University	Required Marketing course	Undergraduate	30
4	Boston University	Organizational Behavior elective	M.B.A. (Part–Time)	28
5	University of Arizona	Organizational Behavior elective	M.B.A.	30
6	Boston University	Organizational Behavior elective	M.B.A. (Part–Time)	36

TABLE 2

BUYER AND SELLER SCHEDULES FOR POSITIVELY AND NEGATIVELY FRAMED NEGOTIATIONS

TABLE 2a
Seller Net Profit Schedule

	Delivery Time		Discount Terms		Financing Terms
A	$ 000	A	$ 000	A	$ 000
B	200	B	300	B	500
C	400	C	600	C	1000
D	600	D	900	D	1500
E	800	E	1200	E	2000
F	1000	F	1500	F	2500
G	1200	G	1800	G	3000
H	1400	H	2100	H	3500
I	1600	I	2400	I	4000

TABLE 2b
Buyer Net Profit Schedule

	Delivery Time		Discount Terms		Financing Terms
A	$ 4000	A	$ 2400	A	$ 1600
B	3500	B	2100	B	1400
C	3000	C	1800	C	1200
D	2500	D	1500	D	1000
E	2000	E	1200	E	800
F	1500	F	900	F	600
G	1000	G	600	G	400
H	500	H	300	H	200
I	000	I	000	I	000

TABLE 2c

Seller Expense Schedule (Gross Profit = $8,000)

	Delivery Time		Discount Terms		Financing Terms
A	$ -1600	A	$ -2400	A	$ -4000
B	-1400	B	-2100	B	-3500
C	-1200	C	-1800	C	-3000
D	-1000	D	-1500	D	-2500
E	-800	E	-1200	E	-2000
F	-600	F	-900	F	-1500
G	-400	G	-600	G	-1000
H	-200	H	-300	H	-500
I	000	I	000	I	000

TABLE 2d

Buyer Expense Schedule (Gross Profit = $8,000)

	Delivery Time		Discount Terms		Financing Terms
A	$ 000	A	$ 000	A	$ 000
B	-500	B	-300	B	-200
C	-1000	C	-600	C	-400
D	-1500	D	-900	D	-600
E	-2000	E	-1200	E	-800
F	-2500	F	-1500	F	-1000
G	-3000	G	-1800	G	-1200
H	-3500	H	-2100	H	-1400
I	-4000	I	-2400	I	-1600

TABLE 3

CELL MEANS FOR TRANSACTIONS, AVERAGE PROFIT PER TRANSACTION, AND TOTAL PROFIT

FRAME

CONSTRAINT: 4600 LIMIT

	NEGATIVE					POSITIVE			
MARKET	TRANS	AVPRF	TOTAL	n	MARKET	TRANS	AVPRF	TOTAL	n
1	4.20	4955	20820	5	1	6.40	4884	31280	5
2	9.38	4849	45025	8	2	8.75	4708	41063	8
3	8.14	5103	41200	7	3	9.50	5101	48388	8
4	11.43	5047	57343	7	4	11.00	4988	54938	8
5	12.33	4957	61167	6	5	12.63	4872	61338	8
6	13.40	5287	70520	10	6	16.00	5066	80822	9
TOTAL	10.26	5052	51774	43	TOTAL	11.11	4943	54991	46

CONSTRAINT: NONE

	NEGATIVE					POSITIVE			
MARKET	TRANS	AVPRF	TOTAL	n	MARKET	TRANS	AVPRF	TOTAL	n
1	4.83	4285	20866	6	1	5.33	4852	26033	6
2	7.88	4280	33125	8	2	8.63	4293	36838	8
3	7.63	4856	37050	8	3	8.14	5025	39957	7
4	9.88	4872	47417	6	4	11.00	4795	52586	7
5	12.75	4383	55013	8	5	14.38	4418	63400	8
6	15.44	4581	70622	9	6	15.88	4572	72125	8
TOTAL	10.07	4540	45484	45	TOTAL	10.84	4639	49611	44

OVERALL MEANS: TRANS=10.57 (S.D.=3.88), AVPRF=4792 (S.D.=502), TOTAL=50481 (S.D.=18761)

FIGURE 1

HYPOTHETICAL VALUE FUNCTION ACCOUNTING FOR FRAMING

VALUE UNITS

LOSSES

GAINS

LIVES

Risk Neutrality Line ------

Hypothetical Value Curve ——

Note: Modified from Kahneman and Tversky (1979)

FIGURE 2
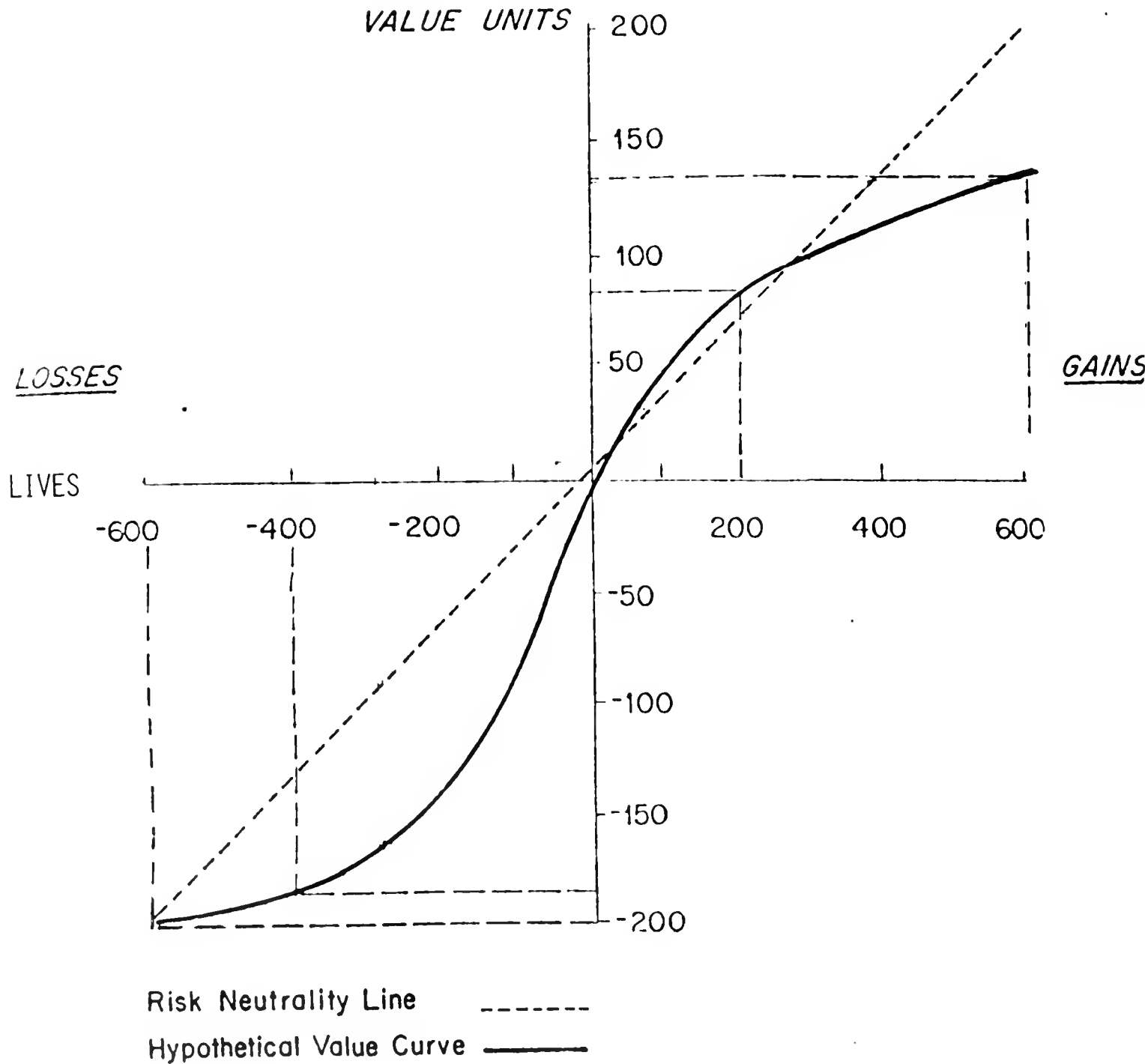
AVERAGE PROFIT FOR BUYERS AND SELLERS OF TRANSACTIONS COMPLETED
IN EACH 5 MINUTE SEGMENT OF THE MARKET (AGGREGATED ACROSS MARKETS)

COORDINATES FOR SIX TIME PERIODS

TIME PERIOD

1	0-5 min.	(4534.9, 4007.9)
2	6-10 min.	(4617.2, 4350.0)
3	11-15 min.	(4869.2, 4475.0)
4	16-20 min.	(4983.7, 4681.6)
5	21-25 min.	(5056.6, 4817.7)
6	26-30 min.	(5182.1, 4819.5)

BUYER'S PROFIT
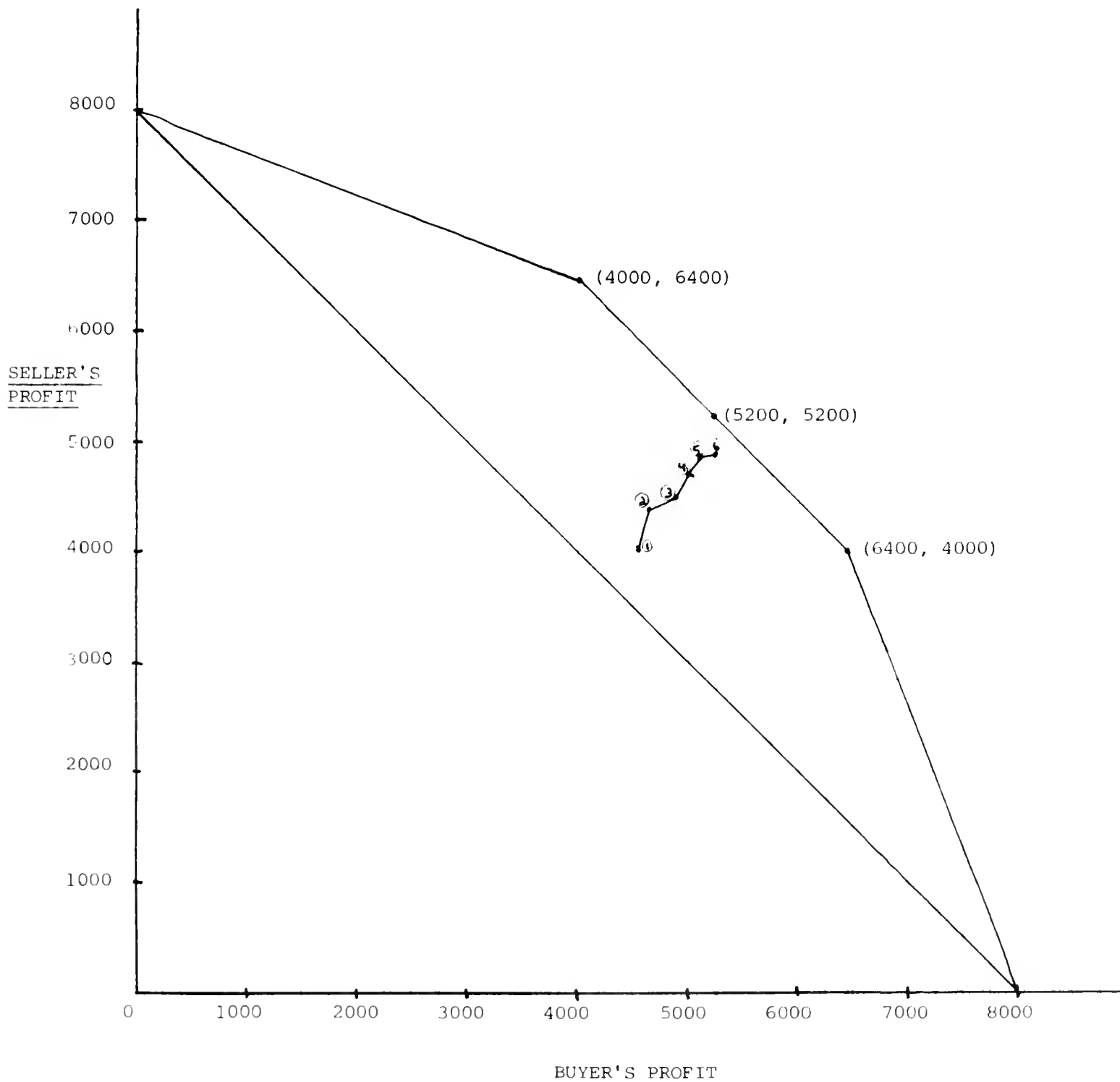
BUYER PROFITS (BP) AND SELLER PROFITS(SP) ACROSS TIME FOR EACH MARKET
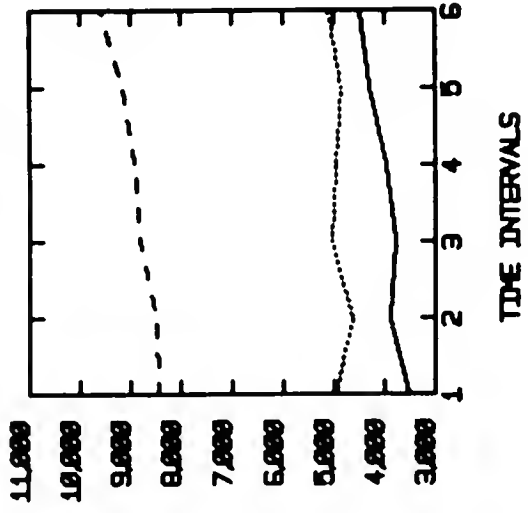

FIGURE 2A, MARKET 1
FIGURE 2B, MARKET 2
FIGURE 2C, MARKET 3
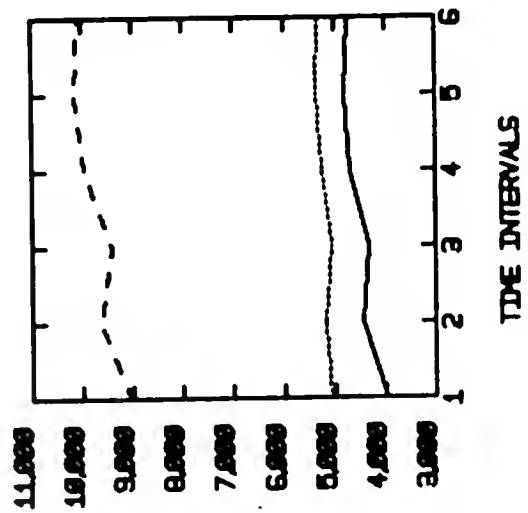FIGURE 2D, MARKET 4
FIGURE 2E, MARKET 5
FIGURE 2F, MARKET 6
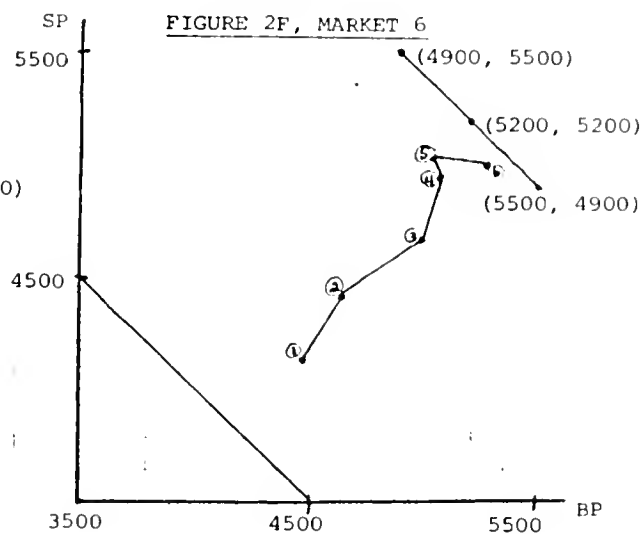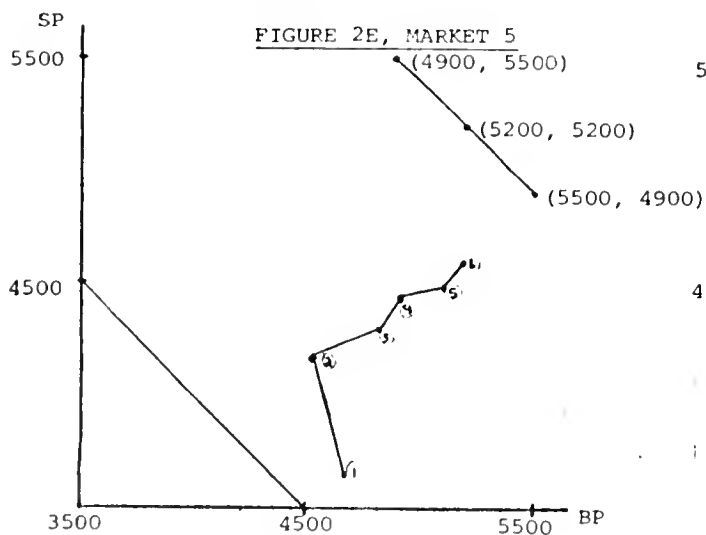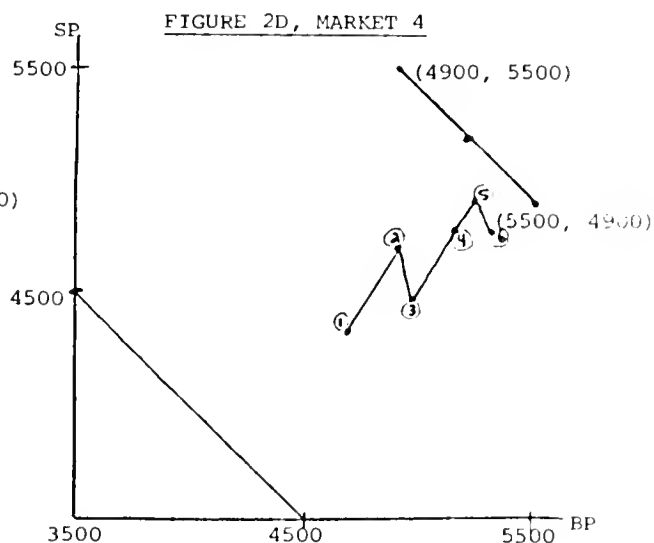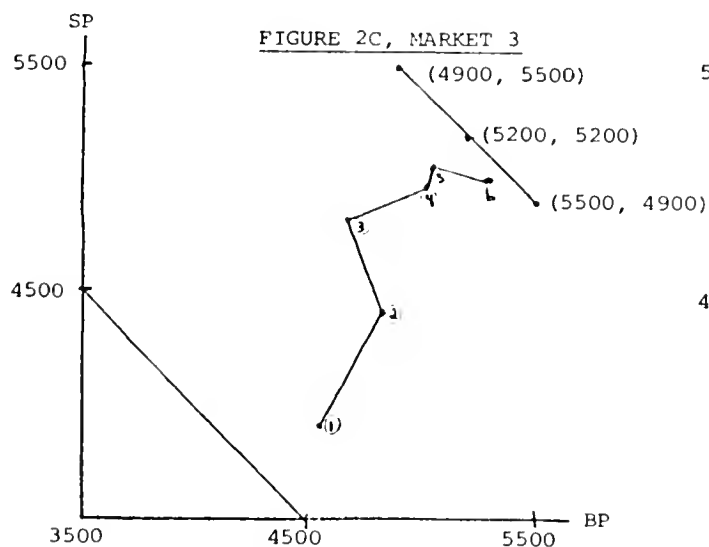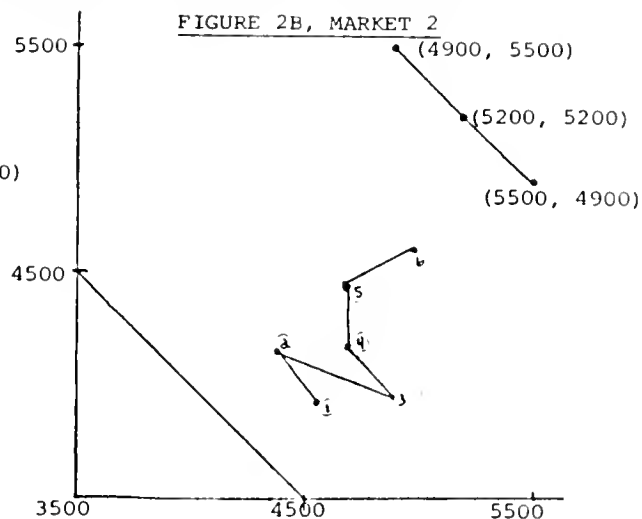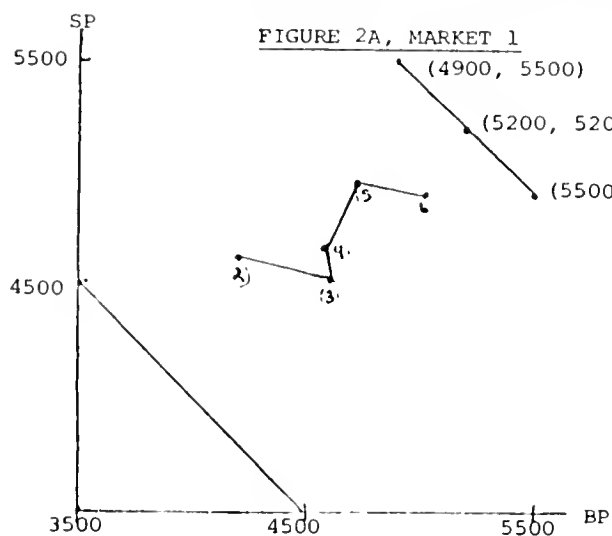
FIGURE 3

MEANS OF MORE AND LESS SUCCESSFUL NEGOTIATOR
IN EACH 5 MINUTE SEGMENT OF THE MARKET (AGGREGATED ACROSS MARKETS)
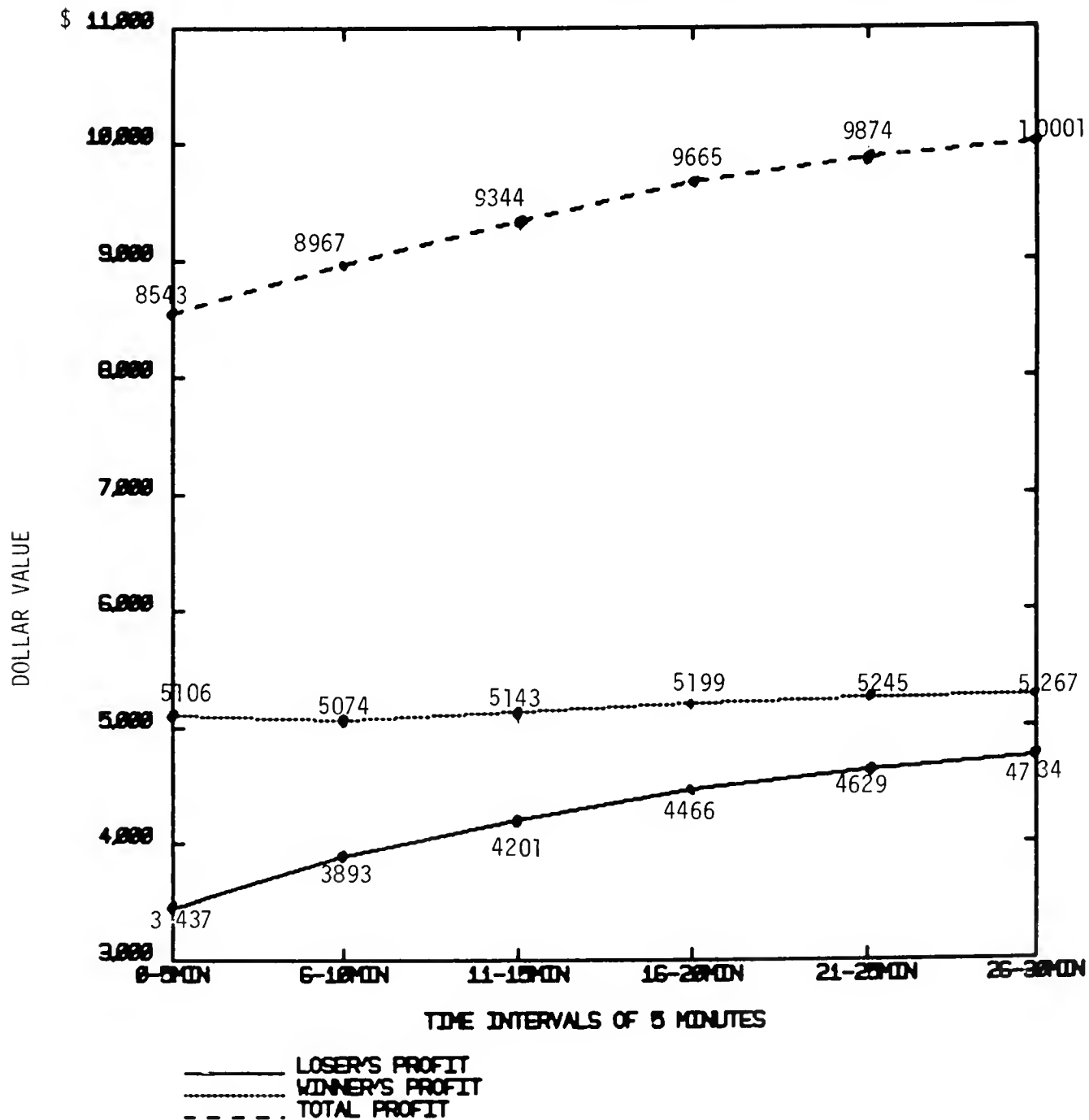
FIGURES 3A TO 3F

MEANS OF MORE AND LESS SUCCESSFUL NEGOTIATOR IN EACH 5 MINUTE SEGMENT OF THE
MARKET FOR EACH MARKET

FIGURE 3C, MARKET 3
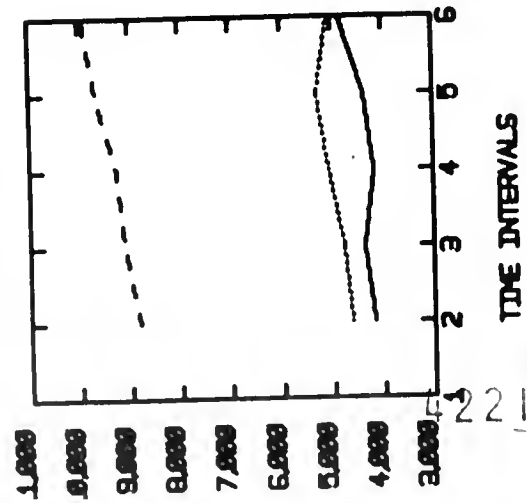
FIGURE 3B, MARKET 2

FIGURE 3A, MARKET 1
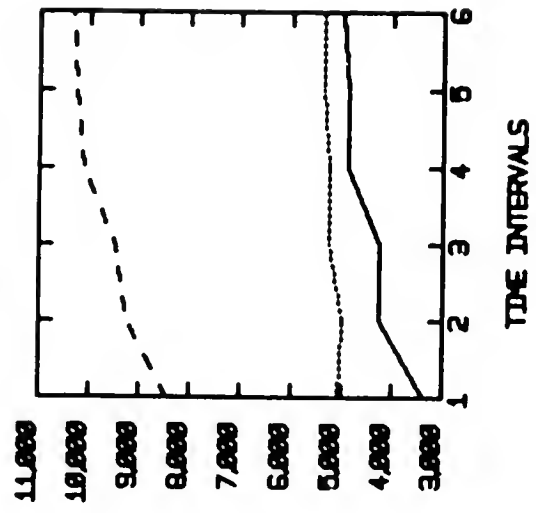
FIGURE 3F, MARKET 6

FIGURE 3E, MARKET 5

FIGURE 3D, MARKET 4

TIME INTERVALS
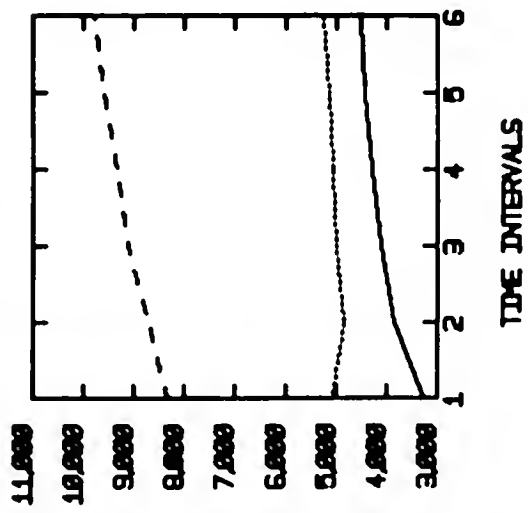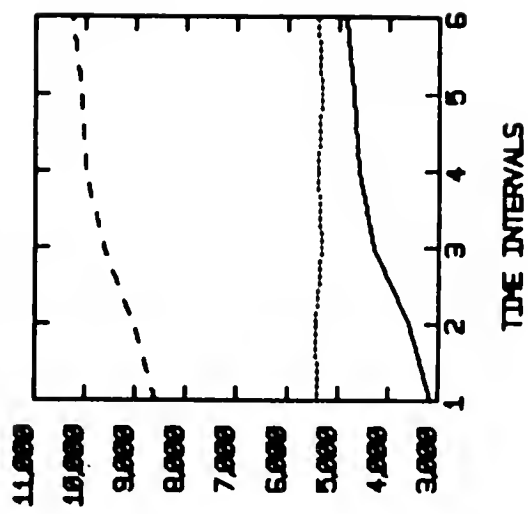
LEGEND:

LOSER'S PROFITS
WINNER'S PROFITS
TOTAL PROFITS

4221 004

Date Due

BASEMENT